

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: Andrew Bell et al.

Examiner: R. Rabago

Serial No.

Group Art Unit: 1711

Filed: August 2, 2001

**For: IN MOLD ADDITION POLYMERIZATION OF NORBORNENE-TYPE  
MONOMERS USING GROUP 10 METAL COMPLEXES**

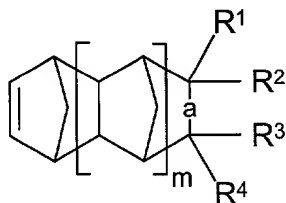
Box: New Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

**IN THE CLAIMS**

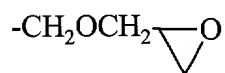
Please substitute the following claims for the pending claims of the same number.

56. (Amended) The reactant composition claim 33, wherein said polycycloolefin comprises a monomer selected from a compound of the formula:

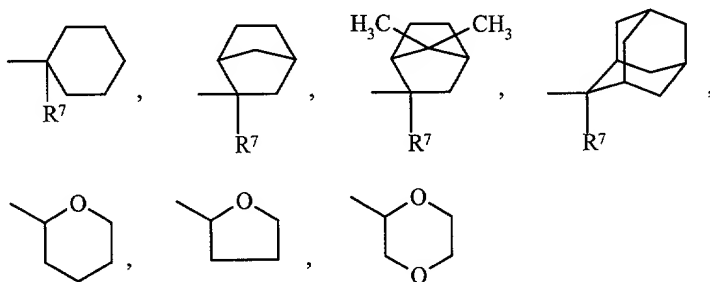


wherein "a" represents a single or double bond; m is an integer from 0 to 5; when "a" is a double bond one of R<sup>1</sup>, R<sup>2</sup> and one of R<sup>3</sup>, R<sup>4</sup> is not present; and R<sup>1</sup> to R<sup>4</sup> independently represent hydrogen, substituted and unsubstituted linear and branched C<sub>1</sub>-C<sub>10</sub> alkyl, linear and branched C<sub>1</sub>-C<sub>10</sub> haloalkyl, substituted and unsubstituted linear and branched C<sub>2</sub>-C<sub>10</sub> alkenyl, linear and branched C<sub>2</sub>-C<sub>10</sub> haloalkenyl, substituted and unsubstituted linear and branched C<sub>2</sub>-C<sub>10</sub> alkynyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> cycloalkyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> halocycloalkyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> cycloalkenyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> halocycloalkenyl, substituted and unsubstituted C<sub>6</sub>-C<sub>12</sub> aryl, substituted and unsubstituted

C<sub>6</sub>-C<sub>12</sub> haloaryl and substituted and unsubstituted C<sub>7</sub>-C<sub>24</sub> aralkyl, R<sup>1</sup> and R<sup>2</sup> or R<sup>3</sup> and R<sup>4</sup> can be taken together to represent a C<sub>1</sub>-C<sub>10</sub> alkylidenyl group, -(CH<sub>2</sub>)<sub>n</sub>C(O)NH<sub>2</sub>, -(CH<sub>2</sub>)<sub>n</sub>C(O)Cl, -(CH<sub>2</sub>)<sub>n</sub>C(O)OR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-OR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-OC(O)R<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-C(O)R<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-OC(O)OR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>SiR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>Si(OR<sup>5</sup>)<sub>3</sub>, -(CH<sub>2</sub>)<sub>n</sub>C(O)OR<sup>6</sup>, and the group:



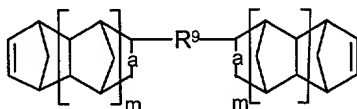
wherein n independently represents an integer from 0 to 10 and R<sup>5</sup> independently represents hydrogen, linear and branched C<sub>1</sub>-C<sub>10</sub> alkyl, linear and branched, C<sub>2</sub>-C<sub>10</sub> alkenyl, linear and branched C<sub>2</sub>-C<sub>10</sub> alkynyl, C<sub>5</sub>-C<sub>12</sub> cycloalkyl, C<sub>6</sub>-C<sub>14</sub> aryl, and C<sub>7</sub>-C<sub>24</sub> aralkyl; R<sup>6</sup> represents a radical selected from -C(CH<sub>3</sub>)<sub>3</sub>, -Si(CH<sub>3</sub>)<sub>3</sub>, -CH(R<sup>7</sup>)OCH<sub>2</sub>CH<sub>3</sub>, -CH(R<sup>7</sup>)OC(CH<sub>3</sub>)<sub>3</sub>, dicyclopropylmethyl, dimethylcyclopropylmethyl, or the following cyclic groups:



wherein R<sup>7</sup> represents hydrogen or a linear or branched (C<sub>1</sub>-C<sub>5</sub>) alkyl group; R<sup>1</sup> and R<sup>4</sup> together with the two ring carbon atoms to which they are attached can represent a substituted or unsubstituted cycloaliphatic group containing 4 to 30 ring carbon atoms, a substituted or unsubstituted aryl group containing 6 to 18 ring carbon atoms and combinations thereof; R<sup>1</sup> and R<sup>4</sup> can be taken together to form the divalent bridging group, -C(O)-Q-(O)C-, which when taken together with the two ring carbon atoms to which they are attached form a pentacyclic ring, wherein Q represents an oxygen atom or the group N(R<sup>8</sup>), wherein R<sup>8</sup> is selected from hydrogen, halogen, linear and branched C<sub>1</sub>-C<sub>10</sub> alkyl, and C<sub>6</sub>-C<sub>18</sub> aryl.

59. (Amended) The reactant composition of claim 33, wherein said composition further comprises a rate moderator selected from the group consisting of water, tetrahydrofuran, 2-methyltetrahydrofuran, diethyl ether, methyl-*tert*-butyl ether, dimethoxyethane, diglyme, trimethylphosphine, triethylphosphine, tributylphosphine, tri(ortho-tolyl)phosphine, tri-*tert*-butylphosphine, tricyclopentylphosphine, tricyclohexylphosphine, triisopropylphosphine, trioctylphosphine, triphenylphosphine, tri(pentafluorophenyl)phosphine, methyldiphenylphosphine, dimethylphenylphosphine, trimethylphosphite, triethylphosphite, triisopropylphosphite, ethyl diphenylphosphinite, tributylphosphite, triphenylphosphite, diethylphenylphosphonite, and tribenzylphosphine, 2-cyclohexenone, triphenylphosphine oxide, and mixtures thereof.

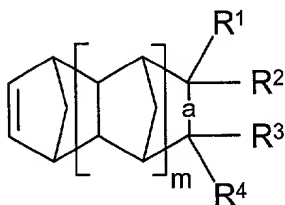
74. (Amended) The multifunctional polycycloolefin monomer set forth in claims 55, wherein said monomer is selected from a composition of the formula:



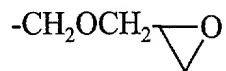
wherein "a" independently represents a single or double bond, m independently is an integer from 0 to 5,  $R^9$  is a divalent radical selected from divalent hydrocarbyl radicals and divalent ether radicals.

The following is a **marked** version of the prior pending claims with all changes shown in conventional comparison:

56. (Amended) The reactant composition claim [32,] 33, [43, 44, 48, or 55] wherein said polycycloolefin comprises a monomer selected from a compound of the formula:

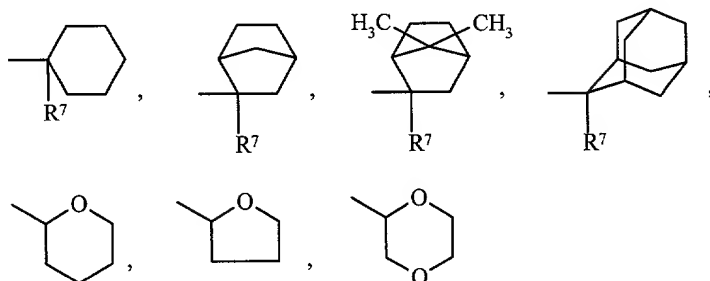


wherein "a" represents a single or double bond; m is an integer from 0 to 5; when "a" is a double bond one of R<sup>1</sup>, R<sup>2</sup> and one of R<sup>3</sup>, R<sup>4</sup> is not present; and R<sup>1</sup> to R<sup>4</sup> independently represent hydrogen, substituted and unsubstituted linear and branched C<sub>1</sub>-C<sub>10</sub> alkyl, linear and branched C<sub>1</sub>-C<sub>10</sub> haloalkyl, substituted and unsubstituted linear and branched C<sub>2</sub>-C<sub>10</sub> alkenyl, linear and branched C<sub>2</sub>-C<sub>10</sub> haloalkenyl, substituted and unsubstituted linear and branched C<sub>2</sub>-C<sub>10</sub> alkynyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> cycloalkyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> halocycloalkyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> cycloalkenyl, substituted and unsubstituted C<sub>4</sub>-C<sub>12</sub> halocycloalkenyl, substituted and unsubstituted C<sub>6</sub>-C<sub>12</sub> aryl, substituted and unsubstituted C<sub>6</sub>-C<sub>12</sub> haloaryl and substituted and unsubstituted C<sub>7</sub>-C<sub>24</sub> aralkyl, R<sup>1</sup> and R<sup>2</sup> or R<sup>3</sup> and R<sup>4</sup> can be taken together to represent a C<sub>1</sub>-C<sub>10</sub> alkylidenyl group, -(CH<sub>2</sub>)<sub>n</sub>C(O)NH<sub>2</sub>, -(CH<sub>2</sub>)<sub>n</sub>C(O)Cl, -(CH<sub>2</sub>)<sub>n</sub>C(O)OR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-OR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-OC(O)R<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-C(O)R<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>-OC(O)OR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>SiR<sup>5</sup>, -(CH<sub>2</sub>)<sub>n</sub>Si(OR<sup>5</sup>)<sub>3</sub>, -(CH<sub>2</sub>)<sub>n</sub>C(O)OR<sup>6</sup>, and the group:



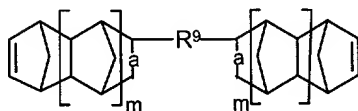
wherein n independently represents an integer from 0 to 10 and R<sup>5</sup> independently represents hydrogen, linear and branched C<sub>1</sub>-C<sub>10</sub> alkyl, linear and branched, C<sub>2</sub>-C<sub>10</sub> alkenyl, linear and branched C<sub>2</sub>-C<sub>10</sub> alkynyl, C<sub>5</sub>-C<sub>12</sub> cycloalkyl, C<sub>6</sub>-C<sub>14</sub> aryl, and C<sub>7</sub>-C<sub>24</sub> aralkyl; R<sup>6</sup> represents a

radical selected from  $-\text{C}(\text{CH}_3)_3$ ,  $-\text{Si}(\text{CH}_3)_3$ ,  $-\text{CH}(\text{R}^7)\text{OCH}_2\text{CH}_3$ ,  $-\text{CH}(\text{R}^7)\text{OC}(\text{CH}_3)_3$ , dicyclopropylmethyl, dimethylcyclopropylmethyl, or the following cyclic groups:



wherein  $\text{R}^7$  represents hydrogen or a linear or branched ( $\text{C}_1\text{-C}_5$ ) alkyl group;  $\text{R}^1$  and  $\text{R}^4$  together with the two ring carbon atoms to which they are attached can represent a substituted or unsubstituted cycloaliphatic group containing 4 to 30 ring carbon atoms, a substituted or unsubstituted aryl group containing 6 to 18 ring carbon atoms and combinations thereof;  $\text{R}^1$  and  $\text{R}^4$  can be taken together to form the divalent bridging group,  $-\text{C}(\text{O})\text{-Q-(O)C-}$ , which when taken together with the two ring carbon atoms to which they are attached form a pentacyclic ring, wherein Q represents an oxygen atom or the group  $\text{N}(\text{R}^8)$ , wherein  $\text{R}^8$  is selected from hydrogen, halogen, linear and branched  $\text{C}_1\text{-C}_{10}$  alkyl, and  $\text{C}_6\text{-C}_{18}$  aryl.

59. (Amended) The reactant composition of claim [32,] 33, [43, 44, 48, 55 or 56] wherein said composition further comprises a rate moderator selected from the group consisting of water, tetrahydrofuran, 2-methyltetrahydrofuran, diethyl ether, methyl-*tert*-butyl ether, dimethoxyethane, diglyme, trimethylphosphine, triethylphosphine, tributylphosphine, tri(ortho-tolyl)phosphine, tri-*tert*-butylphosphine, tricyclopentylphosphine, tricyclohexylphosphine, triisopropylphosphine, trioctylphosphine, triphenylphosphine, tri(pentafluorophenyl)phosphine, methyldiphenylphosphine, dimethylphenylphosphine, trimethylphosphite, triethylphosphite, triisopropylphosphite, ethyl diphenylphosphinite, tributylphosphite, triphenylphosphite, diethylphenylphosphonite, and tribenzylphosphine, 2-cyclohexenone, triphenylphosphine oxide, and mixtures thereof.

[illegible]

wherein "a" independently represents a single or double bond, m independently is an integer from 0 to 5, R<sup>9</sup> is a divalent radical selected from divalent hydrocarbyl radicals and divalent ether radicals.

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